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**Abstract**

5       A scanner for reading characters from a string of characters recorded on a surface as well as reading bar code information encoded in bar codes. Upon obtaining either the text or the bar code information, the information is transferred to a remote location via impulse radio wireless techniques. The character or  
10      bar code scanner may include a lens of variable magnification so as to accommodate variable size print. The scanner is in communication with an external information processing apparatus such as a computer through an impulse radio wireless transmitter/receiver. The value of each pixel detected by the  
15      scanner is determined by comparing the light reflection value with a threshold that is adjusted in accordance with the values of pixels detected and averaged over previous frames. The hand-held scanner and impulse radio transceiver and impulse radio antenna may be housed in any elongate housing for pen-like use or  
20      in a palm-held housing such as a typical mouse. The novel impulse radio wireless interface allows large data throughput while avoiding many traditional wireless shortfalls such as multipath and RF and optical interference. Distance determination by impulse radio means provides for varying the  
25      data rates of the communication between the impulse radio and a remote device based on said distance and allows for a warning that the distance from said remote device to said scanner is exceeding a predetermined limit.